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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/929,329	08/13/2001	Haixiang Liang	13184US01	8681

7590 01/28/2005
McAndrews, Held & Malloy, Ltd.
34th Floor
500 W. Madison St.
Chicago, IL 60661

EXAMINER

LUGO, DAVID B

ART UNIT	PAPER NUMBER
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2637

DATE MAILED: 01/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/929,329

Applicant(s)

LIANG, HAIXIANG

Examiner

David B. Lugo

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 1-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “306” has been used to designate both the discrete-time representation $A(z)$ of TEQ and idealized filter transfer function $B(z)$ (see Fig. 3).
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 320 (page 16, para. 42).
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 214 (Fig. 2), 408 (Fig. 4). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application.
4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claims 1-20 are objected to because of the following informalities:
- a. Claim 1 recites the limitation “the formed signals” in line 7. There is insufficient antecedent basis for this limitation in the claim.
 - b. Claim 1 recites the limitation “the receiver training estimates” in lines 14-15. There is insufficient antecedent basis for this limitation in the claim.
 - c. Claim 1, line 17, “the cyclic prefix” should be --a cyclic prefix--.
 - d. Claim 3, line 1, “method of Claim 3” should be --method of Claim 2--.
 - e. Claim 3, line 1, it is suggested that “the signal” be changed to --the signal $B(z)$ --.
 - f. Claim 5 discloses the discrete-time signals $A(z)$ and $H(z)$. However, $A(z)$ and $H(z)$ are previously referred to in base claim 1 as a time domain equalizer response and a channel response, respectively. Thus, referring to $A(z)$ and $H(z)$ as discrete-time signals is inconsistent with their prior description and should be corrected.
 - g. Claim 9 recites the limitation “the formed signals” in line 12. There is insufficient antecedent basis for this limitation in the claim.
 - h. Claim 13 recites that the order of the residual output signal is chosen to be **less than or equal to** a specified cyclic prefix, while in claim 9, it is stated that the degree of the signal is only **less than** a cyclic prefix. Thus, if the cyclic prefix of claim 9 is the same as the specified cyclic prefix of claim 13, the degree of the signal in claim 13 is broader than that specified in claim 9, and the claim is not further limiting.
 - i. Claim 16 recites the limitation “the formed signals” in line 9. There is insufficient antecedent basis for this limitation in the claim.

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- j. Claim 16, line 13, "the energy signal" should be --the error signal--.
- k. Claim 17 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim (see objection to claim 13 above).
- l. Claim 19, line 1, it is suggested that "the receiver device" be changed to --the device--.
- m. Claims 2, 4, 6-8, 10-12, 14, 15, 18 and 20 are objected to as being dependent upon an objected base claim.

Appropriate correction is required.

Allowable Subject Matter

6. Claims 1-20 would be allowable if rewritten or amended to overcome the objections set forth in this Office action.

7. The following is a statement of reasons for the indication of allowable subject matter:

Lee et al. disclose a TEQ structure in Fig. 4 where filter taps of an equalizer and a target response are determined. Ginesi et al. U.S. Patent 6,404,806 disclose a time domain equalizer in Fig. 6 where the error, $e_k = r_k - z_k$, is minimized in order to calculate the time domain equalizer taps. However, the prior art of record fails to teach, inputting a unit one signal to the channel response, whereby the error signal is set to zero, and the relationship: error signal = (combined response) – (residual response), becomes (combined response) = (residual response), and coefficients corresponding to the TEQ and residual output signal are derived such that the error signal is minimized.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Strait et al. U.S. Patent 6,834,079 disclose an implementation for equalization multicarrier channels using time domain equalization.

9. This application is in condition for allowance except for the formal matters indicated above.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David B. Lugo whose telephone number is 571-272-3043. The examiner can normally be reached on M-F; 9:30-6.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dl

1/19/05


KHAİ TRAN
PRIMARY EXAMINER
KHAİ TRAN
PRIMARY EXAMINER
1/21/05